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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/871,779	06/01/2001	Dunling Li	TI 32794	3005

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EXAMINER

LEWIS, MICHAEL A.

ART UNIT PAPER NUMBER

2655

DATE MAILED: 08/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/871,779

Applicant(s)

LI ET AL.

Examiner

Michael A Lewis

Art Unit

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 - 16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 January 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>02.03 & 05</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Drawings

1. Fig. 1 is objected to because it should be labeled as "prior art". *Correction is required.*

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1,3 & 5 – 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Benyassine et al. (IEEE 0163-6804/97).

Regarding claim 1, Benyassine et al. disclose a method of initializing an ITU Recommendation G.729 Annex B voice activity detection (VAD) device (Fig. 1), comprising the steps of: extracting a set of parameters from a signal that characterize said signal (Page 66, Paragraph 6); calculating an energy measure of said signal from said set of parameters (Page 66, Equation 1 & 2); comparing said energy measure with a reference value (Page 67, Paragraph 1); determining an initial value for an average of a noise characteristic of said signal (Page 67, Paragraph 7);

and counting the number of times said energy measure equals or exceeds said reference level(Page 67, Paragraph 3)[*Benyassine et al. describe a series of smoothing steps where the active voice decision is extended to current frame based on whether previous frames exceed a threshold*].

Regarding claim 3, Benyassine et al. disclose the method of initializing an ITU Recommendation G.729 Annex B voice activity detection (VAD) device, comprising the steps of (See Fig 2): extracting a set of parameters characterizing a signal from a digital representation of said signal within a data frame, wherein said parameters are the autocorrelation coefficients, which are derived in accordance with said Recommendation G.729, and are denoted by $\{R(i)\}_{i=0}^{p}$ (Page 66, Eqn. 1); calculating a full-band frame energy by multiplying a value of ten times a base ten logarithm of a quotient obtained by dividing a first autocorrelation coefficient $R(0)$, of said autocorrelation coefficients, by a constant value of 240(Page 66, Paragraphs 1 ; Eqn 1); comparing said full-band frame energy with a reference level(Page 66, Paragraph 8); updating initial values for averages of the noise characteristics in accordance with said Recommendation G.729 Annex B(Page 67, Paragraphs 3 - 7); and changing the value of a frame counter during said initialization only if said full-band frame energy equals or exceeds said reference level(Page 67, Paragraphs 3 - 7).

Regarding claim 5, Benyassine et al. disclose the method of converging an ITU Recommendation G.729 Annex B voice activity detection (VAD) device, comprising the steps of: determining a noise identification threshold value; comparing a number of energy measures of a signal to said noise threshold value (Page 67, Paragraphs 8 - 11); determining a first value representing an average of said number of energy measures, when said energy measure is less than said noise threshold, wherein only the energy measures of said number of energy measures having values less than said noise threshold value are used to determine said first value (Page 68, Paragraph 2); determining a second value representing an average of said number of energy measures (Page 68, Paragraphs 2 - 3); and substituting said first value for said second value when a specific event occurs (Page 68, Paragraph 3).

Regarding claim 6, Benyassine et al. disclose the method wherein: said specific event is an increasing divergence between said first and second values with time (Page 68, Paragraph 3).

Regarding claim 7, Benyassine et al. disclose the specific event is the expiration of a period of time (Page 68, Paragraph 4). *[Frames correspond directly with time. Benyassine et al. describe that if a significant change occurs more than two frames after an updated SID frame, a new SID*

frame is generated and sent]

Regarding claim 8, Benyassine et al. disclose comprising the step of: counting the number of consecutive times said energy measures of said number of energy measures equal or exceed a reference value, wherein only the energy measures of said number of energy measures having values less than said reference value are used to determine said second value, and said specific event is a predetermined number of consecutive times said energy measures of said number of energy measures equal or exceed said reference value(Page 68, Paragraph 5).

Regarding claim 9, Benyassine et al. disclose a method of converging an ITU Recommendation G.729 Annex B voice activity detection (VAD) device, comprising the steps of (Fig 1 & 2): determining a noise identification threshold value; comparing a number of energy measures of a signal to said noise threshold value; determining a differential spectral distance [*comparison of the Itakura distances*], .DELTA.SD, between a current spectral state of said signal and a value representing an average of a number of prior spectral states of said signal(Page 68, Paragraph 5); updating a first set of values representing averages of said signal's noise characteristics, when said energy measure is less than said noise threshold; updating a second set of values representing averages of said signal's noise characteristics, when said energy measure is less than a

reference value and said differential spectral distance has a value less than about 0.0637; and substituting said first value for said second value when a specific event occurs(Page 68, Paragraph 5).

Regarding claim 10, Benyassine et al. disclose the step comprising of: counting the number of consecutive times said energy measures of said number of energy measures equal or exceed said reference value, wherein said specific event is a predetermined number of consecutive times said energy measures of said number of energy measures equal or exceed said reference value (Page 67, Paragraph 3; Page 68, Paragraph 5) *[Benyassine et al. describe the energy measure on a frame by frame and over several frames]*.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claim 2,4 and 11 - 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Benyassine et al. (IEEE 0163-6804/97) in view of Li et al. (US6381570).

Regarding claims 2 and 4, Benyassine et al. disclose the method steps for converging an ITU Recommendation G.729 Annex B voice activity detection (VAD) device as described in claims 1 and 3. Benyassine et al. do not disclose performing the method steps in their listed order, until said number of times equals thirty-two. However, Li et al. teach disclose performing the method steps in their listed order, until said number of times equals thirty-two (Col 5, Line 16). Dividing an update period into 32 sub-periods and repeating the process would yield features that are more representative of the actual speech.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify Benyassine et al. by performing the sequential

process of steps as described by Li since it would have yielded more accurate feature extraction.

In regards to claims 11 - 15, Benyassine et al. disclose the method of converging an ITU Recommendation G.729 Annex B voice activity detection (VAD) device as described in claims 5 and 9. Benyassine et al. do not disclose the method further comprising the steps of: determining the lesser of two values $T_{sub.1}$ and $T_{sub.2}$, multiplying said lesser value of $T_{sub.1}$ and $T_{sub.2}$ by two to obtain a product; comparing said product to a value of -21 dBm; assigning the lesser value of -21 dBm and said product to said noise threshold value for an updating period, $\tau_{sub.p}$. In addition, Benyassine et al. do not disclose the method comprising the steps of: measuring the maximum block energy occurring during said updating period, $\tau_{sub.p}$, and assigning said measured maximum block energy to $E_{sub.max}$; measuring the minimum block energy occurring during said updating period, $\tau_{sub.p}$, and assigning said measured maximum block energy to $E_{sub.min}$; calculating said value of $T_{sub.1}$ given by the equation $T_{sub.1} = E_{sub.min} + (E_{sub.max} - E_{sub.min})/32$; and calculating said value of $T_{sub.2}$ given by the equation $T_{sub.2} = 4 * E_{sub.min}$.

However, Li et al. teach the method further comprising the steps of: determining the lesser of two values $T_{sub.1}$ and $T_{sub.2}$, multiplying said

lesser value of $T_{sub.1}$ and $T_{sub.2}$ by two to obtain a product; comparing said product to a value of -21 dBm; assigning the lesser value of -21 dBm and said product to said noise threshold value for an updating period, $\tau_{sub.p}$ (Col 7, Lines 48 – 60). Threshold setting schemes are important. In addition, Li et al. teach the method comprising the steps of: measuring the maximum block energy occurring during said updating period, $\tau_{sub.p}$, and assigning said measured maximum block energy to $E_{sub.max}$; measuring the minimum block energy occurring during said updating period, $\tau_{sub.p}$, and assigning said measured maximum block energy to $E_{sub.min}$; calculating said value of $T_{sub.1}$ given by the equation $T_{sub.1} = E_{sub.min} + (E_{sub.max} - E_{sub.min})/32$; and calculating said value of $T_{sub.2}$ given by the equation $T_{sub.2} = 4 * E_{sub.min}$ (Col 7, Line 40 – Col 8, Line 10). In a dynamic speech coding scheme, an adaptive estimate of noise and active signal levels based on minimum and maximum block energy is crucial for high performance voice activity detection.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify Benyassine et al. with the use of an adaptive threshold scheme using minimum and maximum block energy as described by Li since it would have yielded improved results in voice activity detection.

In regards to claim 16, Benyassine et al. disclose the method of converging an ITU Recommendation G.729 Annex B voice activity detection (VAD) device as described in claims 5 and 9. Benyassine et al. do not disclose the step of: updating said noise threshold value about every 1.28 seconds during a communication link. However, Li et al. teach the step of: updating said noise threshold value about every 1.28 seconds during a communication link (Col 6, Line 25 – 35). An Update period of 1.28 seconds is used for the desired compression, active signal quality and bandwidth savings.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify Benyassine et al. with updating said noise threshold value about every 1.28 seconds during a communication link as described by Li since it is necessary for the desired compression, active signal quality and bandwidth savings.

Conclusion

1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- | | | |
|------|-----------------------|-------------------|
| i. | LeBlanc | (US20020075856A1) |
| ii. | LeBlanc | (US20020075857A1) |
| iii. | Rotola-Pukkila et al. | (US6662155) |
| iv. | Nelson et al. | (US6556967) |

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|-------|-----------------------|-------------------|
| v. | Menendez-Pidal et al. | (US6768979) |
| vi. | Thyssen et al. | (US6633841) |
| vii. | Mustel et al. | (US6424942) |
| viii. | El-Malch et al. | (US6631139) |
| ix. | Wang | (US20010014857A1) |

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A. Lewis whose telephone number is 703 305-8730. The examiner can normally be reached on Monday through Friday, 8:30 am – 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on (703) 305-4827. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Lewis A Michael
Examiner
Art Unit 2655

Mal

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A handwritten signature in black ink, appearing to be 'W. R. Young', written in a cursive style.

W. R. YOUNG
PRIMARY EXAMINER